

What is claimed:

- 1 1. A method for adjusting the curvature of an air bearing surface of a slider, the
2 slider including a leading edge, a trailing edge opposite the leading edge, and a back surface
3 opposite the air bearing surface, the back surface including a substantially rectangular shape
4 having four corner areas including first and second corner areas adjacent to the trailing edge
5 and third and fourth corner areas adjacent to the leading edge, wherein the first and third
6 corner areas are diagonally opposite to one another and the second and fourth corner areas
7 are diagonally opposite to one another, the method comprising:
8 scribing at least one line in one of the first or second corner areas; and
9 scribing at least one line in one of the third or fourth corner areas;
10 wherein the scribe lines are made in diagonally opposite corner areas.
- 1 2. A method as in claim 1, wherein the scribe lines in each of the diagonally
2 opposite corner areas are substantially parallel to one another and to the leading edge.
- 1 3. A method as in claim 2, wherein a plurality of scribe lines are made in one set
2 of opposite corner areas selected from the group consisting of the first and third corner areas
3 and the second and fourth corner areas.
- 1 4. A method as in claim 1, wherein the scribe lines are made using a laser.
- 1 5. A method as in claim 1, wherein the scribe lines are made using a system
2 selected from the group consisting of pulsed laser, a continuous laser, and a diamond scribe.
- 1 6. A method as in claim 1, wherein the scribe lines are made using a method
2 that modifies the surface stress of the slider.

1 7. A method as in claim 1, wherein at least one of said scribe lines is made up of
2 a plurality of dots extending along a line.

1 8. A method as in claim 1, wherein the scribe lines are formed to extend in a
2 path selected from the group consisting of a straight path and a curved path.

1 9. A method as in claim 1, wherein the scribe lines are formed at any angle to
2 the leading edge of the slider.

1 10. A method as in claim 1, wherein the scribe lines are formed substantially
2 parallel to the leading edge of the slider.

1 11. A method as in claim 1, wherein the scribe lines are formed substantially
2 perpendicular to the leading edge of the slider.

1 12. A method as in claim 1, wherein at least one scribe line is formed as a series
2 of dots.

1 13. A method as in claim 1, wherein a least one scribe line is formed as a series
2 of line segments.

1 14. A method for altering the twist of a slider including an air bearing surface, a
2 leading edge, a trailing edge opposite the leading edge, and a back surface opposite the air
3 bearing surface, the back surface including an upper right corner region and an upper left
4 corner region adjacent to the trailing edge, and a lower right corner region and a lower left
5 corner region adjacent to the leading edge, the method comprising:
6 forming a plurality of scribes in one of (i) the upper right corner region and the lower
7 left corner region; or (ii) the upper left corner region and the lower right corner region.

1 15. A method as in claim 14, wherein the plurality of scribes are formed in the
2 upper right corner region and the lower left corner region and the twist is increased.

1 16. A method as in claim 14, wherein the plurality of scribes are formed in the
2 upper left corner region and the lower right corner region and the twist is decreased.

1 17. A method as in claim 14, wherein the scribes are formed as lines that are
2 substantially parallel to one another.

1 18. A method as in claim 14, wherein the scribe line formed closest to the trailing
2 edge is located no less than 50 μm from the trailing edge.

1 19. A method as in claim 14, wherein the scribes are formed using a laser.

1 20. A method as in claim 14, wherein the scribes are formed using a system
2 selected from the group consisting of pulsed laser, a continuous laser, and a diamond scribe.

1 21. A method as in claim 14, wherein the scribes are made using a method that
2 modifies the surface stress of the slider.

1 22. A method as in claim 14, wherein the scribes include laser scribes and at least
2 one diamond scribe line is formed on the back surface prior to forming any laser scribes.

1 23. A method as in claim 19, wherein the scribes are each made up of a plurality
2 of dots.

1 24. A method as in claim 17, wherein the scribe lines are 250-300 μm in length.

1 25. A method as in claim 17, wherein the scribe lines are 100-600 μm in length.

1 26. A method as in claim 17, wherein adjacent laser scribe lines are separated
2 from each other by up to 500 μm .

1 27. A method for altering the curvature of a slider including an air bearing
2 surface, a leading edge, a trailing edge opposite the leading edge, and a back surface
3 opposite the air bearing surface, the back surface including an upper right corner region, an
4 upper middle region, and an upper left corner region adjacent to the trailing edge, the back
5 surface also including a lower right corner region, a lower middle region, and a lower left
6 corner region adjacent to the leading edge, the back surface also including a center right
7 region, a center middle region, and a center left region, the method comprising:
8 forming a first scribe in one of the upper right corner region or the upper left corner
9 region; and
10 forming a second scribe in one of the lower left corner region or the lower right
11 corner region, wherein the first and second scribes are located in one of (i) the upper right
12 corner region and lower left corner region, or (ii) the upper left corner region and lower right
13 corner region.

1 28. A method as in claim 27, further comprising a step of forming a third scribe
2 in at least one of the center right region, the center middle region, or the center left region.

1 29. A method as in claim 27, wherein the scribes are formed using at least one of
2 a pulsed laser, a continuous laser, a diamond scribe.

1 30. A method as in claim 27, wherein the scribes are made using a method that
2 modifies the surface stress of the slider.

1 31. A method as in claim 27, wherein the scribe lines are made using a pulsed
2 laser.

1 32. A method for adjusting the twist, crown and camber of an air bearing surface
2 of at least one slider to substantially match target values for twist, crown and camber, the at
3 least one slider having a back surface opposite the air bearing surface, the back surface
4 including two sets of diagonally opposite corner regions, the method comprising:
5 measuring the twist, crown and camber of the at least one slider;
6 forming a first group of twist scribes on the back surface in one of the two sets of
7 diagonally opposite corner regions;
8 forming a first group of crown and camber scribes on the back surface;
9 measuring the twist, crown and camber of the slider and comparing the values to the
10 final target values for twist, crown and camber;
11 forming additional twist scribes if the target value for twist is not reached; and
12 forming additional crown and camber scribes if the target values for crown and
13 camber are not reached.

1 33. A method as in claim 32, wherein the scribes are formed using at least one of
2 a pulsed laser, a continuous laser, a diamond scribe.

1 34. A method as in claim 32, wherein the scribes are made using a method that
2 modifies the surface stress of the slider.

1 35. A method as in claim 32, wherein the scribe lines are made using a pulsed
2 laser.

1 36. A method as in claim 32, wherein the twist scribes are located on a different
2 portion of the back surface than the crown and camber scribes.

1 37. A method as in claim 36, wherein the slider defines a leading edge, and the
2 laser twist scribes are formed in a direction substantially parallel to the leading edge.

1 38. A method as in claim 36, wherein the crown and camber scribes are formed
2 in a direction substantially parallel to the leading edge.

1 39. A method as in claim 36, wherein the crown and camber scribes are formed
2 in a direction substantially perpendicular to the leading edge.

1 40. A method as in claim 36, wherein the laser crown and camber scribes are
2 formed in a center region of the back surface.

1 41. A slider comprising:
2 an air bearing surface;
3 a leading edge adjacent to the air bearing surface;
4 a trailing edge opposite the leading edge;
5 a back surface opposite the air bearing surface, the back surface including an upper
6 right corner region and an upper left corner region adjacent to the trailing edge, the back
7 surface also including a lower right corner region and a lower left corner region adjacent to
8 the leading edge; and
9 a plurality of scribes in one of (i) the upper right corner region and the lower left
10 corner region; or (ii) the upper left corner region and the lower right corner region.

1 42. A slider comprising:
2 an air bearing surface;
3 a leading edge adjacent to the bearing surface;
4 a trailing edge opposite the leading edge;
5 a back surface opposite the air bearing surface, the back surface including an upper
6 right corner region, an upper middle region, and an upper left corner region adjacent to the

7 trailing edge; the back surface also including a lower right corner region, a lower middle
8 region, and a lower left corner region adjacent to the leading edge; the back surface also
9 including a center right region, a center middle region, and a center left region, the method
10 comprising;

11 a least one upper scribe in one of (i) the upper right corner region or (ii) the upper
12 left corner region; and

13 at least one lower scribe in one of (i) the lower left corner region or (ii) the lower
14 right corner region;

15 wherein the upper and lower scribes are located in one of (i) the upper right corner
16 region and lower left corner region, or (ii) the upper left corner region and lower right corner
17 region.

1 43. A slider as in claim 42, further comprising at least one middle scribe in at
2 least one of the center right region, the center middle region, and the center left region.

1 44. A slider as in claim 42, wherein the at least one middle scribe is located in the
2 center middle region.

1 45. A method as in claim 42, wherein the scribes are formed using at least one of
2 a pulsed laser, a continuous laser, a diamond scribe.

1 46. A method as in claim 42, wherein the scribes are made using a method that
2 modifies the surface stress of the slider.

1 47. A method as in claim 42, wherein the scribe lines are made using a pulsed
2 laser.